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P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
PULLIAS, JESSE SCOTT	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/552,772
Filing Date: October 12, 2005
Appellant(s): SCHUIJERS ET AL.

Edward W. Goodman
Philips Intellectual Property & Standards
P.O. Box 3001
Briarcliff Manor, NY 10510
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 05/19/2009 appealing from the Office action mailed 10/24/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The statement of the status of amendments after final contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is

correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

7,006,636	Baumgarte et al.	2-2006
5,774,844	Akagiri	6-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 16, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Baumgarte et al. (7,006,636).

Consider claim 1, Baumgarte discloses a method for generating a wideband time domain output audio signal comprising a left hand audio signal component and a right hand signal component from a wideband time domain input audio signal **(Fig 3,** L, L', R, and R'**)**, the method comprising the steps of:

transforming the wideband time domain input audio signal to a sub-band domain input signal comprising a plurality of input sub-band signals **(Fig 4,** TF transforms**)**, the input sub-band signals in a first frequency range of the wideband frequency range having a narrower frequency band than the input sub-band signals in a second frequency range of the wideband frequency range **(Col 6 lines 25-31,** critical bands inherently cover frequency ranges varying in width, with the higher bands wider**)**;

delaying the sub-band signals so as to obtain delayed sub-band signals **(Col 9 lines 44-47)**;

deriving a first and a second processed sub-band signal by mixing a sub-band signal and a corresponding delayed sub-band signal **(Col 9 lines 48-51,** critical bands delayed, **Col 7 lines 45-50,** critical bands are mixed by weighting factors**)**;

inverse transforming the first processed sub-band signals so as to obtain the left hand audio signal component of the wideband time domain output audio signal **(Col 7 lines 37-40)**, and

inverse transforming the second processed sub-and signals so as to obtain the right hand audio signal component of the wideband time domain output audio signal **(Col 7 lines 37-40)**.

Consider claim 16, Baumgarte discloses a device for generating a wideband time domain output audio signal comprising a left hand audio signal component and a right hand signal component from a wideband time domain input audio signal **(Fig 3,** L, L', R, and R'**)**, the device comprising:

a transformer unit for transforming the wideband time domain input audio signal to a sub-band domain input signal comprising a plurality of input sub-band signals **(Fig 4,** TF transforms**)**, the input sub-band signals in a first frequency range of the wideband frequency range having a narrower frequency band than the input sub-band signals in a second frequency range of the wideband frequency range **(Col 6 lines 25-31,** critical bands inherently cover frequency ranges varying in width**)**;

a delay unit for delaying the sub-band signals so as to obtain delayed sub-band signals **(Col 9 lines 44-47)**;

a mixing unit for deriving a first and a second processed sub-band signal by mixing a sub-band signal and a corresponding delayed sub-band signal **(Col 9 lines 48-51,** critical bands delayed, **Col 7 lines 45-50,** critical bands are mixed by weighting factors**)**;

an inverse transformation unit for inverse transforming the first processed sub-band signals so as to obtain the left hand audio signal component of the wideband time domain output audio signal **(Col 7 lines 37-40)**, and inverse transforming the second processed sub-and signals so as to obtain the right hand audio signal component of the wideband time domain output audio signal **(Col 7 lines 37-40)**.

Consider claim 19, Baumgarte discloses the first frequency range is a low frequency portion of the wideband frequency range and the second frequency range is a high frequency portion of the wideband frequency range **(Col 6 lines 31-35,** lower and higher critical bands**)**.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumgarte et al (7,006,636) in view of Akagiri (5,774,844).

Consider claim 20, Baumgarte discloses:

a first transformation block for transforming the wideband time domain input audio signal into a plurality of narrow band sub-band signals in said first and second frequency range **(Fig 4,** TF transforms**)**;

a delay block for delaying the sub-signals in the second frequency range so as to obtain the input sub-band signals in said second frequency range **(Col 9 lines 44-47,** critical bands are delayed**)**, and wherein the inverse transformation unit comprises:

an inverse transformation block for inverse transforming the first processed sub-band signals in said first frequency range and the first processed sub-band signals in

said second frequency range into said left hand audio signal component of the wideband time domain audio output signal **(Col 7 lines 37-40)**; and

an inverse transformation block for inverse transforming the second processed sub-band signals in said first frequency range and the second processed sub-band signals in said second frequency range into said right hand audio signal component of the wideband time domain output audio signal **(Col 7 lines 37-40)**.

Baumgarte does not specifically teach a second transformation block for transforming the narrow band sub signals in said first frequency range into the input sub-band signals in said first frequency range, the bandwidth of the input sub-band signals in said first frequency range being smaller than the bandwidth of the narrow band sub-signals in said first frequency range; a first inverse transformation block for inverse transforming the first processed sub-band signals in said first frequency range into first processed narrow band sub-band signals in said first frequency range, the bandwidth of the first processed narrow band sub-band signals being larger than the bandwidth of the first processed sub-band signals; and a second inverse transformation block for inverse transforming the second processed sub-band signals in said first frequency range into second processed narrow band sub-band signals in said first frequency range, the bandwidth of the second processed narrow band sub-band signals being larger than the bandwidth of the second processed sub-band signals.

Akagiri discloses a transformation block for transforming narrow band sub signals in said first frequency range **(Fig 1,** 0-5.5kz**)** into the input sub-band signals in said first frequency range **(Fig 1,** MDCT 15**)**, the bandwidth of the input sub-band signals in said

first frequency range being smaller than the bandwidth of the narrow band sub-signals in said first frequency range **(Fig 1,** sub-bands output from MDCT 15 are narrower than input 0-5.5kHz band, **Col 10 lines 31-35)**;

a first inverse transformation block for inverse transforming a first processed sub-band signals in a first frequency range into first processed narrow band sub-band signals in said first frequency range, the bandwidth of the first processed narrow band sub-band signals being larger than the bandwidth of the first processed sub-band signals **(Fig 20,** IMDCT 115**)**; and

a second inverse transformation block for inverse transforming a second processed sub-band signals in said first frequency range into second processed narrow band sub-band signals in said first frequency range, the bandwidth of the second processed narrow band sub-band signals being larger than the bandwidth of the second processed sub-band signals **(Fig 20,** IMDCT 115, **Col 1 lines 8-9,** coding/decoding stereo audio requires IMDCT for each channel synthesized**)**.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Baumgarte to include a second transformation block for transforming the narrow band sub signals in said first frequency range into the input sub-band signals in said first frequency range into the input sub- band signals in said first frequency range, the bandwidth of the input sub-band signals in said first frequency range being smaller than the bandwidth of the narrow band sub-signals in said first frequency range, a first inverse transformation block for inverse transforming the first processed sub-band signals in said first frequency range into first processed

narrow band sub-band signals in said first frequency range, the bandwidth of the first processed narrow band sub-band signals being larger than the bandwidth of the first processed sub-band signals, and a second inverse transformation block for inverse transforming the second processed sub-band signals in said first frequency range into second processed narrow band sub-band signals in said first frequency range, the bandwidth of the second processed narrow band sub-band signals being larger than the bandwidth of the second processed sub-band signals, in order to implement efficient coding/decoding by taking the hearing sense characteristic of the human being into consideration, as suggested by Akagiri **(Col 19 lines 10-15, 31-35).**

Consider claim 21, Baumgarte discloses the mixing unit derives the first and a second processed sub-band signal from the sub-band signal and the corresponding delayed sub-band signal under the influence of parameter signals **(Col 6 lines 66-67,** coherence estimation**).**

Consider claim 22, Baumgarte discloses the mixing unit derives the first processed sub-band signal by combining, in a first combining step, the sub-band signal and the corresponding delayed sub-band signal under the influence of the parameter signals, and derives the second processed sub-band signal by combining, in a second combining step, the sub-band signal and the corresponding delayed sub-band signal under the influence of the parameter signals, said combining steps including scaling the

sub-band signal and the corresponding delayed sub-band signal **(Col 9 lines 45-55,** delaying and scaling with gain factors, based on coherence, see **Col 8 lines 39-45)**.

(10) Response to Arguments

In response to the assertion on page 14 of the Appeal Brief that in Baumgarte, there is no disclosure or suggestion of "the input sub-band signals in a first frequency range of the wideband frequency range having a narrower frequency band than the input sub-band signals in a second frequency range of the wideband frequency range", the examiner respectfully disagrees.

In general, Baumgarte is directed to encoding a stereo signal into a mono signal with parameters, and synthesizing a stereo signal from the mono signal using the parameters, see Fig 3. Page 14 of the Appeal Brief cites Col 6 lines 25-35 and asserts "this section of Baumgarte et al. is describing the generation of the coherence measures (BBC parameters), and not the processing of a wideband time domain input audio signal." The examiner respectfully disagrees with this assertion because in Baumgarte, the BBC parameters are generated from processing the wideband time domain input audio signal such as with a DFT. For example, Col 6 lines 20-21 teach "audio analyzer 310 comprises two time-frequency transform blocks", which indicates that the input to audio analyzer 310 is a "wideband time domain input audio signal" which is "processed".

According to the applicant's analysis of Baumgarte on pages 14-15, signals are transformed into frequency sub-bands which have the same or similar frequency

ranges, which results in a smaller number of sub-bands in the lower critical bands (which, by definition, have a relatively smaller bandwidth) and a larger number of sub bands in the higher critical bands (which by definition, have a relatively larger bandwidth). On page 15, the Brief alleges that "the subject limitation is concerned with the frequency ranges of the sub-bands". It is unclear how the particular language of the claims in question, e.g. claim 1, requires the limitation to be concerned with "the frequency ranges of the sub-bands" as alleged by the brief, because e.g. claim 1, recites in lines 7-10 "the input sub-band signals in a first frequency *range* of the wideband frequency range having a narrower frequency band than the input sub band signals in a second frequency *range* of the wideband frequency range". In other words, the claim languages recites "a first frequency range" having "a narrower frequency band" than "a second frequency range", not "frequency ranges" and "narrower frequency bands" for the sub-bands, and therefore does not require that *each* sub band bandwidth within a first frequency range have a narrower frequency band than *each* sub band bandwidth in a second frequency range. Rather the claim requires that "the input sub band signals in a first frequency range of the wideband frequency range having a narrower frequency band than the input sub band signals in a second frequency range of the wideband frequency range", which is taught by Baumgarte because the "frequency range" for the sub-bands within a lower critical band has a narrower bandwidth than the "frequency range" for the sub-bands within a higher critical band.

In response to assertion on page 15 of the Brief that Baumgarte does not disclose or suggest "deriving a first and a second processed sub-band signal by mixing

a sub-band signal and a corresponding delayed sub-band signal", the examiner respectfully disagrees. In Col 7 lines 45-50 and Col 9 lines 48-51, Baumgarte teaches critical bands are delayed and mixed by weighting, and in Col 9 lines 43-46 Baumgarte teaches a delay offset d and a gain factor g are introduced for each sub-band. This clearly results in a first and second processed sub-band signal that is derived by mixing a sub-band signal and a corresponding delayed sub-band signal, especially because Baumgarte specifically mentions that each sub-band signal is weighted with weighting factors satisfying equation 7 on Col 7, and that each sub-band is delayed.

The examiner respectfully requests that the board upholds the rejection of claims 11, 16, and 19 under 35 U.S.C. 102(e) as being anticipated by Baumgarte et al. and the rejection of claims 20-22 under 35 U.S.C. 103(a) as being unpatentable over Baumgarte et al. in view of Akagiri.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jesse S Pullias/
Examiner, Art Unit 2626

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

Conferees:

/Talivaldis Ivars Smits/
Primary Examiner, Art Unit 2626

/Jesse S Pullias/
Examiner, Art Unit 2626

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626